

Mitsue MIYAZAKI
Serial No. 10/678,309
May 19, 2009

REMARKS/ARGUMENTS

Reconsideration of this application is respectfully requested.

Attention is drawn to the attached supplemental IDS Form PTO/SB/08a and documents cited therein. The IDS fee for this stage of prosecution is also attached.

As requested, a new, more descriptive title has been effected by the above amendment – using the title suggested by the Examiner.

The Examiner is thanked for providing a “response to arguments” section. However, applicant continues to believe that Miyazaki teaches away from the applicant's claimed invention – even in view of the newly discovered reference to Dumoulin. As explained in more detail below, it is believed that the Examiner attempts to mix apples and oranges – and, in the end result, even the proposed inappropriate mixture does not equal the applicant's claimed invention.

The rejection of claims 1-14 under 35 U.S.C. §103 as allegedly being made “obvious” based on Licato '062 in view of Dumoulin '635 and in further view of Nishimura '424 is respectfully traversed.

None of Licato, Nishimura and Dumoulin even suggests imaging by cardiac synchronization.

Further, in Licato, Nishimura and Dumoulin, VENC (the flow encode gradient magnetic field) is used to combine a signal for offsetting a still portion (background

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portion) with a blood signal, and is significantly different from, for example, so-called flow spoiled pulses for reducing the level of the signal. Licato, Nishimura and Dumoulin recite the terms "spin rephase period" and "spin dephase period." The pulses during the two periods are collectively called VENC.

In view of the original object of the phase synchronization (PS) method, these periods are not dealt with independently of each other. In other words, VENC executed in the direction of phase encoding in Licato, Nishimura and Dumoulin cannot be realized using flow spoiled pulses.

Even if all these references were combined, *arguendo*, the feature of the present invention as recited in claim 1, i.e., that flow pulses are applied in the direction of phase encoding during at least one of the first and second (systolic and diastolic) scanning processes, would not result.

The rejection of claims 15-20 under 35 U.S.C. §103 as allegedly being made "obvious" based on Licato/Dumoulin/Nishimura in further view of Miyazaki '376 is also respectfully traversed.

Independent claims 15 and 20 also require systolic and diastolic scanings with at least one of such cardiac-synchronized scanings being performed based on a pulse sequence which includes a magnetic gradient flow pulse spatially oriented in the same direction as a phase encoding magnetic gradient pulse, etc. Accordingly, the

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Licato/Dumoulin/Nishimura combination suffers the same deficiencies as noted above for claim 1. In addition, Miyazaki actually teaches against the Examiner's asserted combination.

Miyazaki describes a technique of imaging by cardiac synchronization during each of the systolic phase and diastolic phase, and applying rephase or dephase pulses in the same direction used for the reading gradient magnetic field pulse. This technique corresponds to the prior art described in the background section of applicant's specification.

Miyazaki does not even suggest the problem that only a little time is available to apply flow pulses without deleteriously extending an echo interval and, hence, only a small degree of freedom is available for placement of flow pulses. The applicant's present invention overcomes this problem by applying flow compensation pulses (or flow spoiled pulses) in the direction of phase encoding.

Licato, Nishimura and Dumoulin each disclose a phase contrast method (PC method). In the PC method, an image, in which flow velocity values are set by spin phase shift differential using velocity encoding (corresponding to VENC, i.e., the flow encode gradient magnetic field in Miyazaki), is obtained by imaging, whereby only a blood vessel of a blood flow velocity corresponding to the set VENC can be observed, and the direction of the blood flow and the flow velocity values can be quantitatively obtained.

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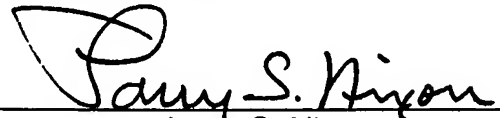
In view of the above-noted deficiencies of features found in each of applicant's independent claims of all four of the references now relied upon by the Examiner, it is not necessary at this time to discuss additional deficiencies of these allegedly "obvious" combinations of references. Suffice it to note that, as a matter of law, it is impossible to support even a *prima facie* case of "obviousness" unless the cited prior art teaches or suggests each feature of the rejected claim. In analyzing the teachings of the cited prior art, the explicit teachings of the prior art against claim recitations cannot be ignored. Such actually teach non-obviousness and patentability.

Accordingly, this entire application is now believed to be in allowable condition, and a formal notice to that effect is earnestly solicited.

Respectfully submitted,

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